Dr. RAMESH KUMAR NAYAK, Ph.D (Engineering)

Associate Professor

Department of Materials and Metallurgical Engineering

Maulana Azad National Institute of Technology, Bhopal, M.P, India-462003

Phone Number:+91-8763724080

Email: rameshkumarnayak@gmail.com;lonavi@manit.ac.in

https://www.scopus.com/authid/detail.uri?authorId=57188581245

https://orcid.org/0000-0002-4468-0912

https://scholar.google.co.in/citations?user=ksS6jnoAAAAJ&hl=en

linkedin.com/in/r-k-nayak-561609351

Area of research- Metal Casting and Simulation, FRP Nanocomposites, Development Functionally Graded Materials and Corrosion

1. Education Qualification

Degree	Discipline	University	CGPA / %	Year of Completion
Ph.D.	School of Mechanical Engineering	KIIT, deemed to be University, Bhubaneswar, Odisha	10.0	2016
M.Tech	Materials and Metallurgical Engineering	Indian Institute of Technology, Kanpur	08.0	2005
B.E	Metallurgical and Materials Engineering	Utkal University, Bhubaneswar, Odisha	72.9	2002

Ph.D. Thesis Titled: Assessment of Hydrothermal Durability of Nano-Al_2O_3 and TiO_2 Enhanced Glass Fiber Reinforced Polymer Composites.

PhD Supervisor: Professor Bankim Chandra Ray, Professor, NIT Rourkela

M.Tech. Thesis Titled: Mathematical Modeling of Temperature and Current Distribution of Hall- Heroult Cell (Aluminum Extraction through Electrolytic Cell)

M.Tech Supervisor: Professor Rajiv Shekhar, Professor, IIT Kanpur, Former Director IIT(ISM) Dhanbad

2. Experience

Name of the Organization	Position	Responsibility	Duration
Maulana Azad National Institute of Technology, Bhopal, India	Associate Professor, Materials and Metallurgical Engineering	Teaching and Research, development of sand less casting process	Since, Dec.2023
Maulana Azad National Institute of Technology, Bhopal, India	Assistant Professor, Materials and Metallurgical Engineering	Teaching and Research, development of sand less casting process	2019-2023
KIIT Deemed to be University, Bhubaneswar, India	Associate Professor-I, School of Mechanical Engineering	Teaching and Research	2011-2019
DENSO International India Pvt. Ltd, Gurgaon, India	Manager, R&D, Materials Engineering	Raw materials localization and failure analysis	2014-2015
Hindustan Aeronautics Limited, Bangalore, India	Deputy Manager, Casting Development	Casting Development (Sand and Investment Casting)	2009-2011
General Motors India Technical Center, Bangalore, India	Sr. Engineer, Computer Added Engineering (CAE)	Sand and die casting modeling and Simulation, Interface Heat Transfer Coefficient (IHTC)	2007-2009
National Institute of Technology, Rourkela, India	Lecturer, MME	Teaching and Research	2006-2007

3. Sponsored Research Projects

1. Titled of the Project: Design and development of glass fiber reinforced polymer nanocomposites for aero stealth technology- Experiments and simulations

PI: Dr. Ramesh Kumar Nayak, Approved Budget: **Rs.60.8Lakhs**

Duration: 3 Years (2025-2028)

Funding Agency: AR&DB, DRDO, Ministry of Defence

2. Titled of the Project: Study of various methods used for determining the thickness of centrifugally cast (Spun) ductile iron pressure pipes for water, and sewage, and suggest the thickness of pipes along with relevant internal and external protection systems, joints and performance test(s) best suited for Indian conditions.

PI: Dr. Ramesh Kumar Nayak, Approved Budget: **Rs.8.4Lakhs**

Duration: 0.5 Years (2024-2025)

Funding Agency: BIS, New Delhi

3. Titled of the Project: Investigation on the development Al-Al Cladding Material through Compound Casting Process-Experiments and Numerical Simulations

PI: Dr. Ramesh Kumar Nayak, Approved Budget: **Rs.49.57Lakhs**

Industry Share: 10.5Lakhs (NALCO, Bhubaneswar)

Science and Technology, Ministry of Mines, Duration: 2 Years (2022-2024)

4. Titled of the Project: Sand-less Casting Process

PI: Dr. Ramesh Kumar Nayak, Approved Budget: **Rs.24.94 Lakhs**

Industry Share: 7.4Lakhs (RSB Metaltech Pvt. Ltd, Cuttack, Odisha)

Technology (AMT) Program of DST), Duration: 2Years (2018-2020)

5. Improvement of the quality of ferrous sand-casting products (Mild Steel)

DECG International, Mandideep, Bhopal, M.P., India 2020- Consultancy Project

Approved Amount- 01 **lakh**, 2020-21

4. Patents

1. HYBRID REINFORCED POLYMER COMPOSITES (Published)

Name of the Inventors: Dr. Ramesh Kumar Nayak and Mr. Dipak Kumar Jesthi

Name of the Patent: Indian Patent

Patent Application Ref. Number: 201831001313

Patent Application Number: TEMP/E-1/1275/2018-KOL

Date of filling: 11-01-2018,

Name of the Beneficiary: KIIT, deemed to be University, Bhubaneswar

2. NATURAL FIBER/GLASS FIBER HYBRID COMPOSITES (Published)

Name of the Inventors: Dr. Ramesh Kumar Nayak, Subham Kumar Sahoo and Sukalyan

Name of the Patent: Indian Patent

Patent Application Ref. Number: 201831042745
Patent Application Number: TEMP/E-1/46274/2018-KOL
Date of filling: 14-11-2018

5. Awards/Achievement/outreach Activities

A. Associate Editor in the internation journal (ESCI and Scopus Indexed) titled “Discover Applied Sciences”, Springer Nature, since June, 2024
B. Listed in top 2% scientists worldwide reported by Stanford University, USA (2022,2023and 2024)
C. General Electric (GE) foundation scholarship for Academic and Leadership Excellence, Indian Institute of Technology, Kanpur, 2003-2004
D. Qualified GATE-2002 and all India Rank-119, GATE-2007, all India Rank-169
E. Suggestion award from Hindustan Aeronautics Limited, Bangalore for “ Improvement to decrease the lead time and cost of production for Strut Support” investment casting by Foundry and Forge Division, HAL Bangalore,2011
F. Suggestion award from Hindustan Aeronautics Limited, Bangalore for “ Improvement of the existing gating system for Breather Adopter Investment Casting” by Foundry and Forge Division, HAL Bangalore,2011

G. Best technical paper award in non-ferrous category from The Institute of India Foundrymen, 2012.
H. Second Position in the poster competition held during "National Science Day", KIIT University, Bhubaneswar.28th Feb.2013
I. Second Position in the Project display competition during "National Science Day", KIIT University, Bhubaneswar.28th Feb.2014

7. Publications (3 reference books, , 31 Scopus/SCI indexed refereed journal papers, 44 Scopus indexed conference proceedings papers, 8 book chapters, 2 patents and invention disclosures, Scopus h-index of 20, Google Scholar h-index of 23 and i10 of 46)

Sl No	Journal Articles	Scopus /SCI	Impact Factor
1	Patel, D.S., **Nayak, R.K.** Design and development of fly ash-modified bentonite clay in green sand mold casting process for A356 alloy casting, The Journal of The Minerals, Metals & Materials Society (TMS) (JOM), 2025	SCI	2.1
2	Patel, D.S., **Nayak, R.K.** Design and development of Copper Slag mold for A356 Alloy Casting, Transaction of Indian Institute of Metals, **2025, 78(2), 48**	SCI	1.5
3	Patel, D.S., **Nayak, R.K.** Copper Slag as an Alternative to Silica Sand for A356 Alloy Casting-Feasibility Study. Inter Metalcast **(2024).**	SCI	2.6
4	Patel, D.S., **Nayak, R.K.** Blast Furnace Slag as an Alternative to Silica Sand for A356 Alloy Casting-Feasibility Study **(2024)** International Journal of Metalcasting, 18, 2703–2720	SCI	2.6
5	Nayak, S., Sahoo, B.P., **Nayak, R.K.** et al. Improvement of low-velocity impact and tribo-mechanical properties of unsymmetrical hybrid composites through addition of nanoclay. Bull Mater Sci 47, 237 **(2024).**	SCI	1.9
6	**Nayak, R.K.,** Sadarang, J., Kumar, A. Development of Fe–Cr Slag mold for Al–Si Alloy (A356) Casting (2023) International Journal of Metalcasting, 17 (3), pp. 1661-1672.	SCI	2.6
7	**Nayak, R.K.,** Sadarang, J. Development of A356 Alloy Green Sand Mold Casting Process Using Narmada Riverbed Sand in India: Design of Experiment and Optimization (2023) International Journal of Metalcasting, 17 (2), pp. 1296-1307.	SCI	2.6
8	Rout, S., **Nayak, R.K.,** Patnaik, S.C., Yazdani Nezhad, H.	ESCI	3.0

	Development of Improved Flexural and Impact Performance of Kevlar/Carbon/Glass Fibers Reinforced Polymer Hybrid Composites (2022) Journal of Composites Science, 6 (9), art. no. 245		
9	**Nayak, R.K**., Sadarang, J. Feasibility Study of Stone-Dust as an Alternative Material to Silica Sand for Al–Si (A356) Alloy Casting (2022) International Journal of Metalcasting, 16 (3), pp. 1388-1396.	SCI	2.6
10	**Nayak, R.K.,** Sadarang, J. A Study on the Suitability of Mahanadi Riverbed Sand as an Alternative to Silica Sand for Indian Foundry Industries (2022) Transactions of the Indian Institute of Metals, 75 (5), pp. 1169-1179.	SCI	1.5
11	Nayak, S., **Nayak, R.K**., Panigrahi, I. Effect of nano-fillers on low-velocity impact properties of synthetic and natural fibre reinforced polymer composites- a review (2022) Advances in Materials and Processing Technologies, 8 (3), pp. 2963-2986.	SCI	2.0
12	Sadarang, J., **Nayak, R.K.,** Panigrahi, I. Challenges and Future Prospective of Alternative Materials to Silica Sand for Green Sand Mould Casting: A Review (2021) Transactions of the Indian Institute of Metals, 74 (12), pp. 2939-2952.	SCI	1.5
13	Saroj, S., **Nayak, R.K.** Improvement of Mechanical and Wear Resistance of Natural Fiber Reinforced Polymer Composites Through Synthetic Fiber (Glass/Carbon) Hybridization (2021) Transactions of the Indian Institute of Metals, 74 (11), pp. 2651-2658.	SCI	1.5
14	Nayak, S., **Nayak, R.K.,** Panigrahi, I. Improvement of Low-Velocity Impact and Abrasive Wear Resistance of Carbon/Glass Fiber-Reinforced Polymer Hybrid Composites (2021) Transactions of the Indian Institute of Metals, 74 (9), pp. 2245-2254.	SCI	1.5
15	Sadarang, J., **Nayak, R.K**. Utilization of fly ash as an alternative to silica sand for green sand mould casting process (2021) Journal of Manufacturing Processes, 68, pp. 1553-1561.	SCI	6.1
16	Sahoo, A.K., Panda, A., Nayak, B.B., Kumar, R., Das, R.K., **Nayak, R.K.** Machinability model and multi-response optimisation of process parameters through regression and utility concept (2021) International Journal of Process Management and Benchmarking, 11 (3), pp. 390-414.	Scopus	NA
17	Jesthi, D.K., **Nayak, R.K.** Sensitivity analysis of abrasive air-jet machining parameters on machinability of carbon and glass fiber reinforced hybrid composites (2020) Materials Today Communications, 25, art. no. 101624,	SCI	3.7
18	Nayak, S., Sadarang, J., Panigrahi, I., **Nayak, R.K.,** Maurya, M. Optimization of composite leaf spring for reduced weight and improved noise, vibration, and harshness in an electric vehicle(2020) Noise and Vibration Worldwide, 51 (7-9), pp. 127-138.	Scopus	NA
19	Nayak, S., Pattnaik, S., Panigrahi, I., **Nayak, R.,** Parida, S.	SCI	1.08

	Small delamination detection in carbon fibre reinforced polymer composite beam by NDT and vibration analysis (2020) Indian Journal of Engineering and Materials Sciences, 27 (3), pp. 789-794.		
20	Jesthi, D.K., **Nayak, R.K.** Influence of glass/carbon fiber stacking sequence on mechanical and three-body abrasive wear resistance of hybrid composites (2020) Materials Research Express, 7 (1), art. no. 015106, .	SCI	1.8
21	**Nayak, R.K.** Influence of seawater aging on mechanical properties of nano-Al2O3 embedded glass fiber reinforced polymer nanocomposites (2019) Construction and Building Materials, 221, pp. 12-19.	SCI	7.4
22	Jesthi, D.K., **Nayak, R.K.** Evaluation of mechanical properties and morphology of seawater aged carbon and glass fiber reinforced polymer hybrid composites (2019) Composites Part B: Engineering, 174, art. no. 106980, .	SCI	12.7
23	Jesthi, D.K., **Nayak, R.K.** Improvement of mechanical properties of hybrid composites through interply rearrangement of glass and carbon woven fabrics for marine application (2019) Composites Part B: Engineering, 168, pp. 467-475.	SCI	12.7
24	**Nayak, R.K.,** Ray, B.C. Retention of Mechanical and Thermal Properties of Hydrothermal Aged Glass Fiber-Reinforced Polymer Nanocomposites (2018) Polymer - Plastics Technology and Engineering, 57 (16), pp. 1676-1686.	SCI	2.6
25	**Nayak, R.K.,** Ray, B.C. Influence of seawater absorption on retention of mechanical properties of nano-TiO2 embedded glass fiber reinforced epoxy polymer matrix composites (2018) Archives of Civil and Mechanical Engineering, 18 (4), pp. 1597-1607.	SCI	4.4
26	**Nayak, R.K.,** Ray, B.C. Water absorption, residual mechanical and thermal properties of hydrothermally conditioned nano-Al2O3 enhanced glass fiber reinforced polymer composites (2017) Polymer Bulletin, 74 (10), pp. 4175-4194.	SCI	3.1
27	**Nayak, R.K.,** Mahato, K.K., Routara, B.C., Ray, B.C. Evaluation of mechanical properties of Al2O3 and TiO2 nano filled enhanced glass fiber reinforced polymer composites (2016) Journal of Applied Polymer Science, 133 (47), art. no. 44274, .	SCI	2.7
28	**Nayak, R.K.,** Rathore, D., Routara, B.C., Ray, B.C. Effect of nano Al2O3 fillers and cross head velocity on interlaminar shear strength of glass fiber reinforced polymer composite (2016) International Journal of Plastics Technology, 20 (2), pp. 334-344.	Scopus	NA
29	**Nayak, R.K.,** Mahato, K.K., Ray, B.C. Water absorption behavior, mechanical and thermal properties of nano TiO2 enhanced glass fiber reinforced polymer composites (2016) Composites Part A: Applied Science and Manufacturing, 90, pp. 736-747.	SCI	8.1
30	Dash, S., **Nayak, R.K.,** Routara, B.C. Process parameter optimization in drilling Al2O3-and TiO2-filled GFRP composites to minimize thrust force and delamination	ESCI	0.3

	(2016) Composites: Mechanics, Computations, Applications, 7 (1), pp. 1-16.		
31	**Nayak, R.K.,** Sundarraj, S. Selection of initial mold-metal interface heat transfer coefficient values in casting simulations - A sensitivity analysis (2010) Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science, 41 (1), pp. 151-160.	SCI	2.4
32	**Nayak, R.K.,** Sundarraj, S. Sensitivity study of IHTC on solidification simulation for automotive casting (2009) International Journal of Cast Metals Research, 22 (1-4), pp. 294-297.	SCI	1.3

A. Books and Book Chapters

Reference Books

Title	**Hydrothermal Behavior of Fiber- and Nanomaterial-Reinforced Polymer Composites**
Authors	Ramesh Kumar Nayak, Bankim Chandra Ray, Dibyaranjan Rout, Kishore Kumar Mahato
Publisher	CRC Press, 2020
ISBN	1000045730, 9781000045734
Length	236 pages
Subjects	Technology & Engineering,Materials Science,General
Title	**Machining of Nanocomposites**
Authors	Ramesh Kumar Nayak, Mohan Kumar Pradhan, Ashok Kumar Sahoo
Publisher	CRC Press, 2022
ISBN	9781003107743
Length	208pages
Subjects	Engineering & Technology, Physical Sciences

B. Book Chapters

1.	Nayak, R.K., Pradhan, M.K., Mandal, A., Davim, J.P. Preface, (2023) Lecture Notes in Mechanical Engineering
2.	Nayak, R.K., Nezhad, H.Y. Development of fibre-reinforced polymer composites through direct digital manufacturing (2022) Composites Assembly for High Performance Fastener-less Structures, pp. 61-92.
3.	Praharaj, S., Rout, D., Nayak, R.K. Synergistic effect of natural fiber-reinforced polymer composite (2021) Hybrid Natural Fiber Composites: Material Formulations, Processing, Characterization, Properties, and Engineering Applications, pp. 145-165.
4.	Nayak, S., Panigrahi, I., Nayak, R.K. Design and Analysis of Hybrid Composite Leaf Spring for Automotive Applications: An Extensive Study (2020) Springer Proceedings in Materials, 8, pp. 127-132.
5.	Rout, D., Nayak, R.K., Praharaj, S. Aerospace and vehicle industry (2020) Handbook of Polymer Nanocomposites for Industrial Applications, pp. 399-417.
6.	Nayak, R.K., Mahato, K.K., Ray, B.C. Processing of polymer-based nanocomposites (2019) Reinforced Polymer Composites: Processing, Characterization and Post Life Cycle Assessment, pp. 55-75.
7.	Nayak, R.K. Effect of Nano-TiO2 Particles on Mechanical Properties of Hydrothermal Aged Glass Fiber Reinforced Polymer Composites (2019) Nanotechnology in the Life Sciences, pp. 69-93.

C. International Conference Proceedings (Scopus Indexed)

1	Mishra, A., Chanda, S.B., Nayak, R.K., Rout, A.K., Suresh, S. Development and Characterization of Nano-SiO2-Enhanced Polymer Nanocomposites **(2023)** Lecture Notes in Mechanical Engineering, pp. 85-92.
2	Chanda, S.B., Mishra, A., Rout, A.K., Nayak, R.K., Nayak, S.K. Effect of Nano-TiO2 Content (wt.%) on Hardness of Epoxy Polymer Matrix Nanocomposites, (2023) Lecture Notes in Mechanical Engineering, pp. 77-84.
3	Nayak, R.K., Sadarang, J., Patel, D.S., Jain, S., Kumar, R. A Study on Chemical Composition, Morphology, and Hardness of Spheroidal Graphite (SG) and Austempered Ductile Cast Iron (ADI) (2023) Lecture Notes in Mechanical Engineering, pp. 377-385.
4	Barik, S.B., Patidar, P., Bagade, S.S., Kumar, A., Nayak, R.K., Patel, P.K. Recent progress in reinforcement of nanofillers in epoxy-based nanocomposites, (2023) Materials Today: Proceedings
5	Sadarang, J., Nayak, R.K., Panigrahi, I. Ferrochrome Slag as an Alternative Mould Material for Green Sand Mould Casting—A Study (2022) Lecture Notes in Mechanical Engineering, pp. 439-447.
6	Sadarang, J., Nayak, R.K., Panigrahi, I. Evaluation of Compactibility and Shear Strength of Sand-Less Casting Mould for Sand Casting Process (2022) Lecture Notes in Mechanical Engineering, pp. 449-457.
7	Sadarang, J., Nayak, R.K., Panigrahi, I. Utilization of Local Riverbed Sand in Green Sand Mould Casting—A Study (2022) Lecture Notes in Mechanical Engineering, pp. 431-438.
8	Sadarang, J., Nayak, R.K., Panigrahi, I. Utilization of Stone-dust in Sand Mould Casting Process

	(2022) Lecture Notes in Mechanical Engineering, pp. 331-338.
9	Sadarang, J., Nayak, R.K., Panigrahi, I. Assessment of Local River Sand Mould Property at Different Curing Temperatures (2022) Lecture Notes in Mechanical Engineering, pp. 311-317.
10	Sadarang, J., Nayak, R.K., Panigrahi, I. Effect of Fe-Cr Mold Temperature on Mold Hardness, Compressive and Shear Strength (2022) Lecture Notes in Mechanical Engineering, pp. 339-346.
11	Sadarang, J., Nayak, R.K., Panigrahi, I. Effect of binder and moisture content on compactibility and shear strength of river bed green sand mould (2020) Materials Today: Proceedings, 46, pp. 5286-5290.
12	Singh, K., Das, D., Nayak, R.K., Khandai, S., Kumar, R., Routara, B.C. Effect of silanizion on mechanical and tribological properties of kenaf-carbon and kenaf-glass hybrid polymer composites (2020) Materials Today: Proceedings, 26, pp. 2094-2098.
13	Das, D., Pradhan, S.K., Nayak, R.K., Nanda, B.K., Routara, B.C. Influence of curing time on properties of CFRP composites: A case study (2020) Materials Today: Proceedings, 26, pp. 344-349.
14	Saroj, S., Sarangi, R.K., Das, D., Nayak, R.K. Enhancemenet of mechanical and vibrational properties of plywood for packaging and container applications (2019) Materials Today: Proceedings, 18, pp. 3952-3957.
15	Nanda, B.K., Das, D., Nayak, R.K., Mishra, S.B., Routara, B.C., Dhupal, D. Fluidised bed hot abrasive jet machining of borosilicate glass with zircon sand (2019) Materials Today: Proceedings, 18, pp. 2993-3000.
16	Pani, P.R., Nayak, R.K., Routara, B.C., Sekhar, P.C. Flexural and specific wear rate of seawater aged bamboo, jute and glass fiber reinforced polymer hybrid composites (2019) Materials Today: Proceedings, 18, pp. 3409-3414.
17	Mohanty, S., Singh, S.S., Routara, B.C., Nanda, B.K., Nayak, R.K. A comparative study on machining of alsicp metal matrix composite using electrical discharge machine with and without nano powder suspension in dielectric (2019) Materials Today: Proceedings, 18, pp. 4281-4289.
18	Jesthi, D.K., Nayak, R.K., Nanda, B.K., Das, D. Assessment of abrasive jet machining of carbon and glass fiber reinforced polymer hybrid composites (2019) Materials Today: Proceedings, 18, pp. 3116-3121.
19	Chand, S., Chandrasekhar, P., Sarangi, R.K., Nayak, R.K. Influence of B4C particles on processing and strengthening mechanisms in aluminum metal matrix composites -A review (2019) Materials Today: Proceedings, 18, pp. 5356-5363.
20	Das, D., Samal, C., Chaubey, A.K., Nayak, R.K. Influence of thermal treatment and reinforcement content on properties of aluminium matrix composites: A case study (2019) Materials Today: Proceedings, 18, pp. 3262-3267.
21	Das, D., Roy, D.K., Satpathy, M.P., Nanda, B.K., Nayak, R.K. Compressive, impact and flexural behaviour of Al based metal matrix composites (2019) Materials Today: Proceedings, 18, pp. 3080-3086.
22	Nayak, S., Nayak, R.K., Panigrahi, I., Sahoo, A.K. Tribo-mechanical responses of glass fiber reinforced polymer hybrid nanocomposites (2019) Materials Today: Proceedings, 18, pp. 4042-4047.
23	Pandey, A., Kumar, R., Sahoo, A.K., Panda, A., Nayak, R.K. A brief review on ionic fluids and its application in machining (2019) Materials Today: Proceedings, 18, pp. 4441-4448.
24	Das, D., Sharma, M., Samal, C., Nayak, R.K. Investigation of mechanical properties of SiCp reinforced Al 7075 metal matrix composites: A case study (2019) Materials Today: Proceedings, 18, pp. 3958-3965.

25	Singh, K., Nayak, R.K., Das, D., Sahoo, S.K. Improvement of hardness of short fork (6082 Alloy)-A case study (2019) Materials Today: Proceedings, 18, pp. 2515-2519.
26	Khandai, S., Nayak, R.K., Kumar, A., Das, D., Kumar, R. Assessment of mechanical and tribological properties of flax/kenaf/glass/carbon fiber reinforced polymer composites (2019) Materials Today: Proceedings, 18, pp. 3835-3841.
27	Das, D., Dubey, O.P., Sharma, M., Nayak, R.K., Samal, C. Mechanical properties and abrasion behaviour of glass fiber reinforced polymer composites - A case study (2019) Materials Today: Proceedings, 19, pp. 506-511.
28	Singh, N., Panpalia, N., Singh, M.M., Routara, B.C., Nayak, R.K. Comparison of machining characteristics of Inconel 601 with normal and cryogenic cooled electrode in EDM using RSM (2018) IOP Conference Series: Materials Science and Engineering, 455 (1), art. no. 012078, .
29	Jesthi, D.K., Mohanty, S.S., Nayak, A., Panigrahi, A., Nayak, R.K. Improvement of mechanical properties of carbon/glass fiber reinforced polymer composites through inter-ply arrangement (2018) IOP Conference Series: Materials Science and Engineering, 377 (1), art. no. 012182, .
30	Jesthi, D.K., Nayak, A., Mohanty, S.S., Rout, A.K., Nayak, R.K. Evaluation of mechanical properties of hybrid composite laminates reinforced with glass/carbon woven fabrics (2018) IOP Conference Series: Materials Science and Engineering, 377 (1), art. no. 012157
31	Singh, N., Routara, B.C., Nayak, R.K. Study of machining characteristics of Inconel 601 with cryogenic cooled electrode in EDM using RSM (2018) Materials Today: Proceedings, 5 (11), pp. 24277-24286.
32	Kumar Nayak, R., Venugopal, S. Prediction of shrinkage allowance for tool design of aluminium alloy (A356) investment casting (2018) Materials Today: Proceedings, 5 (11), pp. 24997-25005.
33	Mandal, P., Jesthi, D.K., Das, D., Rout, A.K., Nayak, R.K. Three-body abrasion wear performance of glass/carbon fiber reinforced polymer hybrid composites (2018) Materials Today: Proceedings, 5 (9), pp. 20777-20784.
34	Nayak, A., Kumar Jesthi, D., Chandra Routara, B., Das, D., Kumar Nayak, R. Tribological properties of glass/carbon hybrid composites through inter-ply arrangement using Response Surface Methodology (2018) Materials Today: Proceedings, 5 (9), pp. 19828-19835.
35	Nayak, S., Sadarang, J., Panigrahi, I., Kumar Nayak, R. Development of carbon/glass fibre reinforcement polymer hybrid composite through modeling and simulation (2018) Materials Today: Proceedings, 5 (9), pp. 17838-17844.
36	Swarup Mohanty, S., Kumar Rout, A., Kumar Jesthi, D., Chandra Routara, B., Kumar Nayak, R. Evaluation of mechanical and wear performance of glass/carbon fiber reinforced polymer hybrid composite (2018) Materials Today: Proceedings, 5 (9), pp. 19854-19861.
37	Nayak, R.K. Effect of ledge shape on temperature and current distribution of hall-heroult cell: Modeling and simulation (2018) Materials Today: Proceedings, 5 (9), pp. 18755-18760.
38	Das, D., Chakraborty, V., Kumar Chaubey, A., Kumar Nayak, R. Investigation on properties of SiC reinforced Zn-Mg-Cu based Al metal matrix composites - A case study (2018) Materials Today: Proceedings, 5 (9), pp. 19874-19882.

39	Das, D., Chapagain, A., Nayak, R.K., Routara, B.C. Multiple-response optimization for surface quality and productivity during turning Al 7075/SiCp composite in spray cooling environment (2018) Materials Today: Proceedings, 5 (9), pp. 18052-18060.
40	Sadarang, J., Nayak, S., Nayak, G., Panigrahi, I., Nayak, R.K. Dynamic analysis for delamination detection in carbon fiber composite beam (2018) IOP Conference Series: Materials Science and Engineering, 402 (1), art. no. 012143,
41	Jesthi, D.K., Mandal, P., Rout, A.K., Nayak, R.K. Effect of carbon/glass fiber symmetric inter-ply sequence on mechanical properties of polymer matrix composites (2018) Procedia Manufacturing, 20, pp. 530-535.
42	Jesthi, D.K., Mandal, P., Rout, A.K., Nayak, R.K. Enhancement of mechanical and specific wear properties of glass/carbon fiber reinforced polymer hybrid composite (2018) Procedia Manufacturing, 20, pp. 536-541.
43	Nayak, R.K., Rathore, D., Ray, B.C., Routara, B.C. Inter Laminar Shear Strength (ILSS) of Nano Al2O3 Filled Glass Fiber Reinforced Polymer (GFRP) Composite - A Study on Loading Rate Sensitivity (2017) Materials Today: Proceedings, 4 (8), pp. 8688-8696.
44	Dash, S., Routara, B.C., Nayak, R.K. Optimization of process parameters in milling of TiO2 filled GFRP composite (2017) Materials Today: Proceedings, 4 (2), pp. 3023-3032.

8. Workshop/Conference Organized

Sl. No	Name of the workshop/conference	Duration
1.	3rd International Conference on Advances in Materials and Manufacturing Technology (ICAMMT-2024)	17-20th Dec. 2024
2.	National Conference on Compound Casting Technology	19-21st Sept. 2024
3.	Short-Term Training Programme (STTP) on AI/ML in Computational Material Science	02-06th Sept. 2024
4.	2nd International Conference on Advances in Materials and Manufacturing Technology (ICAMMT-2022)	22-26th Nov.-2022
5.	1st International Conference on Advancement in Materials, Manufacturing and Energy Engineering (ICAMME-2021)	18-20th Feb.,2021
6.	Workshop on “Scientific and Technological Writing Skills” (Writing of Research Proposals, Theses, Reports, Research Papers, Drafting and Filing of Patents)	16–20th Dec. 2019

9. PhD Guidance

Sl. No	Name of the Scholar	Title of the Thesis	Year of Completion
1.	Dipak Kumar Jesthi	Evaluation of Mechanical, Tribological Properties and Mechinability of Seawater Aged Carbon and Glass Fiber Reinforced Polymer Hybrid Composites	17/06/2019
2.	Smaranika Nayak	Flexural, Impact, and Tribological Properties of Carbon/Glass Fiber Reinforced Polymer Hybrid Nanocomposites	10/06/2022

3.	Jatin Sadarang	Investigation on Feasibility of Industrial Waste and Local Riverbed Sand for A356 Alloy Casting.	30-06-2023
4.	Dheerendra Singh Patel	Utilization of industrial waste as an alternative molding material to silica Sand for green sand mold casting process	Ongoing, Since 2020
5.	Sourav Jain	Utilization of industrial waste as an alternative molding material to Zircon Sand for Investment casting Process	Ongoing, Since 2022
6.	Rahul Kumar	Investigation on the development Al/Al compound casting and its modelling and simulations	Ongoing, Since 2023
7.	Sharad Sharama	Development of Hybrid FRP composites and its retention of mechanical properties in hydrothermal environment	Ongoing, Since 2024
8.	Vivek Narayan	Development of high plasticity ball clay for high tension disc applications	Ongoing, Since 2024
9.	Prakash	Evaluation of Tribomechanical Properties of hybrid FRP composites	Ongoing, Since 2024
10.	Irfan Wani	Hybrid composites for Aerospace applications	Ongoing, Since 2024

10. M.Tech Scholars (PG Guidance)

Sl. No	Name of the Scholar	Title of the Thesis	Year
1.	Sumit Kumar, MANIT, Bhopal	Evaluation Mechanical Properties of Hydrothermally aged Carbon/Kevlar /Glass Fibers Reinforced Polymer Hybrid Composites	2024
2.	Amish Mishra, MANIT, Bhopal	Development and characterization of nano-silica enhanced epoxy polymer matrix nanocomposites	2022
3.	Sai Babu, MANIT, Bhopal	Development and characterization of nano-TiO_2 enhanced epoxy polymer matrix nanocomposites	2022
4.	Deepti Vishwakarma, MANIT, Bhopal	Synthesis and Characterization of 2D TiC, SiC through DC magnetron sputtering and thermal Annealing	2021
5.	Sonali Rout, IGIT Sarang	Evaluation of mechanical properties of glass/carbon/kevlar reinforced polymer matrix hybrid composites	2021
6.	Preeti Ranjan Pani, KIIT Deemed to be University, Bhubaneswar	Evaluation of mechanical and tribological properties of seawater aged glass, bamboo and jute fiber reinforced hybrid composite	2019
7.	Subhrajyoti Saroj KIIT Deemed to be University, Bhubaneswar	Evaluation of mechanical and tribological properties of natural and synthetic hybrid composite with or without silane treatment	2019

8.	Abheejit Nayak, KIIT Deemed to be University, Bhubaneswar	Development and characterization of sea water aged glass/carbon fiber reinforced hybrid composite	2018
9.	Santhi Swarup Mohanty, KIIT Deemed to be University, Bhubaneswar	Evaluation of tribo mechanical properties of hybrid composites in dry and sea water aged condition	2018
10	Nilesh Singh, KIIT Deemed to be University, Bhubaneswar	Study of machining characteristic of inconel 601 using cryogenic cooled electrode in EDM process	2017
11.	Bhagabat Khuntia, CET Bhubaneswar	Fabrication and evaluation of mechanical and wear properties of carbon/glass fiber reinforced polymer composites	2017
12.	Manas Ranjan Sathua, CET Bhubaneswar	Analysis and characterization of mechanical and vibration effects on hybrid composite	2017
13.	Alina Das, KIIT Deemed to be University, Bhubaneswar	A Study On Mechanical Properties Of Glass Fiber Reinforced Hybrid Composite	2014

11. Administrative Responsibility

Sl. No	**Name of the responsibility**	**Institute/ Department**	**Duration**
1.	**HoD, MME**	Institute/Department Level	**Since April, 2025**
2.	FIC, Technical Activity	Institute Level	May,2024
3.	Coordinator, Central Library	Institute Level	January,2024
4.	President, IIF Student Chapter, MANIT	Department level	August 2024
5.	FIC Foundry Lab	Department level	Feb.2019
6.	FIC corrosion lab	Department level	Feb.2019
7.	Warden, Hostel-10	Institute Level	2019-2023
8.	Core Committee, MANIT Rolta Incubation	Institute Level	2021-2024
9.	Coordinator, ERP	Institute Level	2022-2023
10.	Coordinator, IBC Cell	Institute Level	2020-2023
11.	Coordinator, T&P	Institute Level	2019-2023

12. Skills and Hands on Experience

Manufacturing Process Development

- Fabrication of glass/carbon/Kevlar fiber reinforced polymer composites
- Fabrication of nano fillers (Al_2O_3 and TiO_2) filled glass/carbon/Kevlar fiber reinforced polymer composites

- Methodizing and manufacturing of sand, die and investment casting components for automotive and aerospace industries.
- Vendor development, Localization of raw materials for automotive components(flat, round bars, fin and cladding materials of Aluminum and Steel Alloys)

Material Characterization Techniques

- Field Emission Scanning Electron Microscopy (FESEM),Energy Dispersive X-ray (EDX) for elemental composition in materials
- X-Ray Diffraction (XRD) for phase characterization of materials
- Dynamic Light Scattering (DLS): For particle size and size distribution measurement in colloid
- Universal Testing machine (UTM- Instron): Tensile, three point bend test and effect of strain rate on strength of materials.
- Impact test: Charpy and Izod Test
- Micro vickers and Rockwell hardness testing: To measure the hardness
- Microstructure evaluation with image analyser(Leica, inverted/Upright microscope)
- Surface Roughness Tester (Stylus)
- Surface morphology (Stereo microscope)

Modeling, simulation, Analytical Software Packages

- Casting Software: ProCAST and Magmasoft
- Design of Experiment : Minitab
- Operating Software: MS Office, Origin, Tec plot,
- Programming Language: Python

13. Industrial Projects at Industry (Cost Saving projects of value 100 lakhs)

A. Raw material evaluation of Al-sheetcladdingmaterialBA136PC(7.5,7)-O(N30A ,Granges, China)for the application of Tank Header (Eva. and Condenser)
B. Raw material evaluation of AC2B alloy for localization of Bracket, Compressor mounting for New INOVA Project
C. Raw material evaluation of low cost GSR fin material- DA3973R-H14 for radiator
D. Raw material evaluation for Clutch Barrel and washer for Localization activity (SCM415 & SPCC-SD)
E. Benchmarking of Magneto (XB295&K-42A) to reduce the cost.
F. Raw material evaluation of EDD- lF material for Angle-B localization.
G. Wiper motor core raw material evaluation for localization (CRCS-D).
H. Stay, wiper raw material evaluation for localization (TSGACC-050).
I. Raw material evaluation for AC tube clamp piping (EDD) for localization.
J. Evaluation of washer wave for localization.
K. Failure investigation of surface crack in fuel pumps housing.
L. Failure investigation of radiator leakage

14. Outreach Activities

Sl. No	Activity	Place	Year
1.	Keynote lecture on "FRP Nanocomposites Advantages and Limitations" in the national conference	Vidyapeeth College Bhopal	2025
2.	Technical Seminar on compound casting technology in IIF Indore chapter meeting on 28th February, 2025.	IIF Indore Chapter	2025
3.	BIS, MTD6 (Pig Iron & Cast Iron) Sectional Committee Meeting on 24th March 2025 at MANIT Bhopal. Seminar on technological development and standardization in cast iron sector	MANIT Bhopal	2025
4.	Editorial Board Members – Engineering, SN/Discover Applied Sciences, Springer	Springer	Since 2024
5.	MoU with Raneka Industries Limited, Indore, Madhya Pradesh, 2024-Under Discussion	Indore	2025
6.	Formation of Indian Institute of Foundrymen Student Chapter at MANIT Bhopal, 2024	MANIT Bhopal	October,2024
7.	Advanced technology to remove casting defects	BHEL Bhopal	Nov. 2024
8.	Research Project Proposal Writing	IES University Bhopal	July, 2024
9.	Effect of Hydrothermal Aging on Mechanical Properties of Hybrid Composites	IGIT, Sarang, Talcher	March,2021
10.	Development of Compound Cast Materials and its Challenges	ABIT, Cuttack	March,2021
11.	Corrosion of Materials and Its Control	ABIT, Cuttack	January,2021
12.	Durability of Nano-TiO_2 enhanced FRP Composites in a Hydrothermal Environment	MANIT, Bhopal	July,2020
13	Assessment of Hydrothermal Durability of Nano-Al_2O_3 and TiO_2 Enhanced Glass Fiber Reinforced Polymer Composite	ABIT, Cuttack	December, 2020
14	FRP Composites: Prospects and Problems with Nano fillers Fabrication of nanocomposites and its challenges	Tata Steel Limited, Mew materials Business, Kolkata	May,2018
15	Nano Zr sand to enhance the surface finish of jewelry	TITAN, Bangalore	March,2018

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